

Name _____

STUDY GUIDE Chapter 10: Cell Growth and Division

1. The formation of 2 daughter cells from a single parent cell is called _____. This increases each cell's ratio of _____ to _____, allowing for a more efficient exchange of materials within the cell.

2. Genetically identical offspring are produced from a single parent in _____ reproduction. In _____ reproduction, cells from 2 parents unite to form the first cell of a new organism.

3. Give an example of an organism that uses asexual reproduction and an example of an organism that uses sexual reproduction.

Asexual example

•

Sexual example

•

4. Explain a benefit of asexual reproduction and a benefit of sexual reproduction.

Asexual benefit

•

Sexual benefit

•

5. Compared to eukaryotes, prokaryotes lack a _____, so their DNA is contained in a single, circular chromosome found in the cytoplasm. The cells of bacteria divide by _____, a type of asexual reproduction in which the DNA is replicated and the cell divides in half, producing 2 identical daughter cells.

6. _____ is programmed cell death, _____ forms sex cells for reproduction, and _____ forms new body cells for growth and tissue repair.

7. Human body cells are also called _____ cells. They are considered _____ because they contain 2 sets of chromosomes. In humans, these cells each contain _____ total chromosomes (1 pair of sex chromosomes and 22 pairs of _____). Reproductive cells (or gametes) are considered _____ because they contain 1 set of chromosomes since the union of a sperm and egg restores the diploid state.

8. _____ is the division of the cytoplasm, _____ is the division of the nucleus, and _____ occurs between cell divisions. The chromosomes are copied during the _____ phase of interphase.

9. The first and longest phase of mitosis is _____. The second and shortest phase of mitosis is _____. The third phase of mitosis is _____, and the last phase of mitosis is _____.

10. The nuclear envelope breaks down during _____ and reforms during _____ (at this point there is one at each end). The spindle disassembles during _____ and the centrioles appear and the spindle assembles during _____.

11. Chromatids separate and move apart toward the centrioles at each end of the cell during _____. DNA coils tightly and individual chromosomes first become visible during _____. Chromosomes line up across the middle of the cell during _____.

12. Explain the difference between cytokinesis in animal cells vs plant cells.

13. Identical copies of the same chromosome are called _____. They attach to each other along the _____. Chromosome pairs in meiosis are called _____. They have the same _____ in the same order but may carry different _____.

14. In eukaryotes, _____ produces 2 identical daughter cells, but _____ reduces the number of chromosomes by half to form haploid gametes (egg and sperm). Meiosis mixes up trait combinations, providing genetic _____.

15. During a process called _____, homologs pair up to form a tetrad composed of ____ chromatids. Those homologs then exchange parts during _____. The random alignment of homologs during Metaphase I is called _____. These processes increase genetic diversity!

16. Paired homologs line up across the middle of the cell during _____ of meiosis. Synapsis and crossing over occur during _____ of meiosis. Homologs move apart to opposite poles of the cell during _____ of meiosis. Sister chromatids separate and move apart to opposite poles during _____ of meiosis.

17. Which of the following are produced at the end of Meiosis II? (*circle the correct choice in EACH row*)

- 2 or 4 cells
- Identical or nonidentical cells
- Haploid or diploid cells

18. Explain 5 specific differences between mitosis and meiosis

Mitosis

-
-
-
-
-

Meiosis

-
-
-
-
-

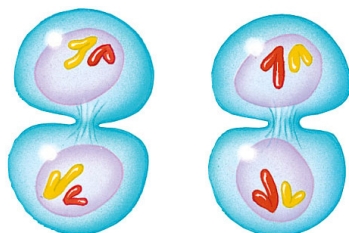
19. Explain why cells need to copy their chromosomes before dividing.

20. **Label** each cell with correct phase of meiosis. Be sure to include I or II for each. Then **explain** how you know the cell(s) is/are in that phase by describing at least **2** pieces of evidence to support your answer.

A. _____

•

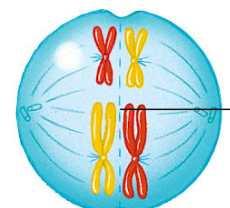
•



B. _____

•

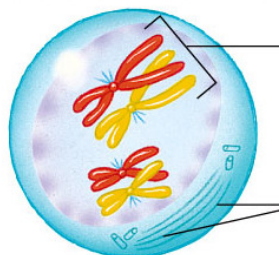
•



C. _____

•

•



D. _____

•

•

